SEA TURTLES IN IRAN, POPULATION ASSESMENT, ECOSYSTEM HEALTH AND CONSERVATION STATUS

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MORSKE KORNJAČE U IRANU, PROCENA POPULACIJE, ZDRAVLJA EKOSISTEMA I KONZERVACIONI STATUS

Globally, populations of sea turtles are declining. All species of sea turtles are listed in Appendix I of the CITES (1). This means that all turtle species are considered endangered by international trade to such an extent that if commercial trade is not eliminated with respect to these species, they will become extinct. Nesting density of hawksbill turtles is low throughout its range (4, 11). Over-hunting of marine turtles for their shells, meat and over-collecting of eggs from nests are some factors attributing to the endangered status of turtles. (5) It is believed that the declining turtle populations in the Iranian waters specially Persian Gulf has been accelerated by the breakdown of traditional conservation practices, the use of powered boats in turtle hunting, commercial sale, habitat degradation, incidental by-catch in fishing gear, and the large scale harvesting of eggs in rookeries. The factors that are known to cause decline in sea turtle populations are generally similar but differences do exist in terms of importance for different populations i.e. in different parts of the world, and with changing laws and technologies through time. For example, before the widespread use of trawlers and high seas gillnets, turtle mortality caused by fishing was minimal but laws were not in force then to protect turtles and their products (5). Hence, there was widespread hunting of turtles for meat, shell and leather. Eggs were also collected extensively for food. Seas were not as polluted then, hence mortality caused by plastics, tar balls, pollutant induced diseases were not as extensive. Similarly, the degree of importance of factors threatening turtles in different parts of the world does differ. A constant cause for decline, independent of time, is when mortality is greater than recruitment. Mortality and recruitment vary, depending on predation, food availability and quality, habitat quality, and many other factors. Because the life cycle of a sea turtle is complex, and includes large periods of time and large expanses of the planet, mortality can occur at many places and many times during an individual turtle's life (2). Natural threats are indiscriminate and may affect any species. Natural predation on eggs and hatchlings is thought to be kept in check by

natural balances of predator prey relationships (6). Predation is so high that it is obvious that a number of terrestrial, marine and avian species depend on sea turtles as a source of protein. Anthropogenic threats to nesting habitats are again indiscriminate and driven more by coastal development, industrialization and the recreational opportunities provided by coastal environments(6).

In Table (1) number of nests in some important site are shown. The numbers represent the actual tally of records recorded during the surveys, some of which may not represent a good estimate for the month due to limited surveys conducted on some beaches during some months.

Table1. Total hawksbill nests and nesting densities expressed as nest per kilometer

Island	Total nests	Beach length(km)
Shidvar	36	2.1
Lavan	24	3.2
Qeshm	56	6.7
Hormuz	34	3.4
Farour	35	4.6
Hendurabi	46	5.7
Overall	231	25.7

Threatening factors

Table 2. Current anthropogenic threat to sea turtle populations in Some of Iranian Islands

Threat	Shidvar	Lavan	Qeshm	Hormuz	Farour	Hendurabi
Habitat alteration and loss	Yes	Yes	Yes	No	No	No
Beach armouring (e.g., concrete sea walls)	No	Yes	Yes	No	No	No
Beach nourishment/sand mining	No	Yes	Yes	No	No	No
Beach cleaning and beach driving	No	No	Yes	No	No	No
Human presence on beach	Yes	Yes	Yes	Yes	No	Yes
Artificial light	No	No	Yes	No	No	No
Boat strikes	Yes	Yes	Yes	Yes	No	Yes
animal predation at rookeries	Yes	No	No	Yes	Yes	No
Oil pollution	?	Yes	Yes	?	No	No
Other pollution sources and entanglement	Yes	Yes	Yes	Yes	No	No
Fishing and incidental capture	No	Yes	Yes	Yes	No	No
Shrimp trawling	No	No	Yes	No	No	No
Pelagic fishing gear	Yes	Yes	Yes	Yes	No	No
Gill nets	No	No	Yes	No	No	No
Traditional and commercial fishing	Yes	Yes	Yes	No	No	No
Egg harvests	Yes	Yes	No	No	No	No
Adult harvests	Yes	Yes	No	No	No	Yes

In fallowing photos most important threatening factors for sea turtles are shown, these photos can say us everything about these valuable animals and their future.

Figure 1. Human activities in nesting sites of sea turtles (Oman Sea beach)

Figure 2. Natural parameters preventing from nesting activity of sea turtles (Shidvar Island)

Most important conservative programs in Iran are nomination of sea turtles as "Endangered animals" of the country, there was a fine of about 3,200,000 Rials for each killed turtle which doubled in the past year (6,400,000 Rials), about $US 700 and also fine for egg collection, about $US 233 for each, nominating of the nesting sites as" under management and control Area" like Mond protected area and Shidvar wildlife refuge and Monitoring of the sites by DOE guards.

All measures that prevent sea turtles from being killed would be of priority. These are:

- Conservation measures or techniques that reduce the incidental catch of adult and juvenile turtles in fishing gears e.g.: (i) use of TEDs in trawlers (shrimp and fishing); (ii) regulate or ban the use of high seas gill-nets; (iii) regulations to protect turtles or restrict the use of fishing methods harmful to turtles off their nesting grounds during the nesting season.

- Conservation measures to curb the hunting and trade of live turtles, adults and juveniles, for meat and other turtle products.
- Conservation measures to curb commercial exploitation of eggs, both legal and illegal.
- Conservation measures to curb the destruction of nesting grounds by beachfront development, seawalls, land reclamation, etc
- Conservation measures to curb the destruction of feeding grounds by trawlers, pollution, land reclamation, etc.
- Conservation measures to prevent the killing or drowning of turtles in man-made structures (e.g. oil rigs) or by powered watercrafts.

In order to respond to a critical conservation situation, as is the case of these sea turtle populations, an agreement must fulfill some requirements: (1) it must include all, or most of the countries involved in the problem; (2) it must be an "agile" organization, capable of facing a dynamic situation without getting bogged down with time consuming formalities; (3) it must turn words into actions very rapidly; and perhaps also, (4) it must have the capability to implement and execute a comprehensive program, and (5) if possible, it is preferable that the agreement is a binding one. It is quite clear that the institution must have a level of credibility with the different stakeholders.

REFERENCES

Conley, W. J. and Hoffmann, B. A. (1987). Nesting activity of sea turtles in Florida, 1979-1985, Florida Scientist 50: 201-210.

Fowler, L.E. (1979). Hatchling success and nest predation in the green sea turtle, *Chelonia mydas*, at Tortuguero, Costa Rica, Ecology 60: 946–955.

Godfrey, M. H. and Barreto, R. (1995). Beach vegetation and sea finding orientation of turtle hatchlings, Biological Conservation 74: 29–32.

Horrocks, J.A. and Scott, N.M. (1991). Nest site location and nest success in the hawksbill turtle *Eretmochelys imbricata* in Barbados, West Indies, Marine Ecology Progress Series 69: 1–8.

Miller, J.D. (1997). Reproduction in sea turtles. In: Lutz, P.L. and Musick, J.A. (Eds.).The Biology of Sea Turtles, Boca Raton: CRC Press, pp. 51–81.

Mortimer, J. A. (1990). The influence of beach sand characteristics on the nesting behavior and clutch survival of green turtles (*Chelonia mydas*), Copeia 1990: 802-817.

Mrosovsky, N. (1983). Ecology and nest site selection of leatherback turtles, *Dermochelys coriacea*. Biological Conservation 26: 47-56.

Packard, G. and Packard. M. (1988). Physiological ecology of reptilian eggs and embryos. In: Gans, C. and Huey, R.B. (Eds.). Biology of the Reptilia, Ecology, Defense and Life History. New York: Alan R. Liss, Inc., 16: 523–605.

Resetarits, W.J. (1996). Oviposition site choice and life history evolution, American Zoologist 36: 205–215.

Shine, R. (1999). Why is sex determination by nest temperature in many reptiles? Trends in Ecology and Evolution 14: 186–189.

Witzell, W. N. (1983). Synopsis of biological data on the hawksbill turtle *Eretmochelys imbricata* (Linnaeus, 1766). FAO Fisheries Synop, Rome: 137, 78 p.